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September 22, 1999

Project 5327.000.0

Mr. Sean Hogan
United States Environmental Protection Agency
Region IX
75 Hawthorne Street
San Francisco, California

Subject: Site Analysis and Work Plan
General Electric- Apparatus Service Shop
1401 East Valencia Road
Tucson, Arizona

Dear Mr. Hogan:

This document was prepared on behalf of General Electric Company (GE) by Geomatrix Consultants, Inc. (Geomatrix) at the request of Mr. Thomas Torres, US Environmental Protection Agency (EPA) in a meeting on June 24, 1999. It presents a summary and analysis of data recently collected at and in the vicinity of the site; and provides a plan for addressing soil at the site containing chemicals.

BACKGROUND

The GE Apparatus Service Shop (the site) is located at 1401 East Valencia Road, Tucson, just to the north of the Arizona Air National Guard site (AANG; Figure 1). Half of the building was constructed in 1972 on property that had been previously undeveloped. The other half was constructed in 1974. The facility currently repairs and restores generators, armatures, and large AC and DC electric motors. In the past, a few polychlorinated biphenyl (PCB)-containing transformers were also repaired. Interviews with site employees and review of site documents indicate that the following chemicals have been handled at the site: transformer oils consisting of mineral oil, PCBs, and trichlorobenzene (TCB); varnishes (which included xylenes); detergents; and cleaning solvents including methyl ethyl ketone (MEK), acetone, and petroleum based cleaners (Safety Kleen products).

According to shop employees, trichloroethylene (TCE) was never used at the site. GE management had banned the use of TCE prior to construction of this facility after a GE employee almost died after inhaling TCE vapors in a closed space at a customer's site.

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At the request of EPA, GE conducted an investigation in 1998 to assess the environmental conditions beneath the site. To assess the presence of volatile organic compounds (VOCs), soil gas samples were collected from shallow soil and analyzed by Tracer Research in an onsite mobile analytical laboratory. To assess the presence of mineral oil, PCBs, TCB, and other VOCs, soil samples were collected using a hollow-stem auger drill rig and analyzed by Del Mar Analytical. This work is documented in a report titled Preliminary Site Characterization Report for General Electric Company, 1401 East Valencia Road, Tucson, Arizona (Dames & Moore, September 23, 1998).

GE also collected two composite drain samples from the below-grade drainage system inside the building. The in-floor drains have been plugged since the mid-1970s, a result of sediment accumulating from the dismantling of mine equipment and motors. Samples of the material in two drain clean-outs were collected and analyzed for PCBs, VOCs, and metals. This work is documented in a memorandum from Brian Andersen (Dames & Moore) to Kate Stern (GE), dated February 23, 1999 that was submitted to EPA shortly thereafter.

The data on chemicals at and in the site vicinity are summarized in the following sections. The discussion is organized into two sections: TCE in the vicinity of the site; and PCBs and TCB in soil at the site.

TCE IN SITE VICINITY

TCE in Soil

GE investigated the potential presence of a source of TCE in shallow soil at the site by collecting soil gas and soil samples outside the building, and sediment samples from the below-ground drain system inside the building. No TCE was detected in the soil samples or the drain samples; very low concentrations of TCE were detected in soil gas across the site. The soil gas results from the site are summarized below and compared with soil data generated at the AANG site located south (hydraulically upgradient) of the site.

Low concentrations of TCE, PCE, 1,1,1-TCA, methylene chloride, chloroform, carbon tetrachloride, and/or 1,2-DCA were detected in the 56 soil gas samples collected; TCE was detected in only 3 of the 56 samples at concentrations greater than 1 microgram per liter ($\mu\text{g/l}$). The maximum VOC concentrations detected were 6.0, 0.6, 0.09, 0.6, 0.08, 0.001, and 0.04 $\mu\text{g/l}$, respectively (see Table 1). The soil gas sampling locations are shown on Figure 2.

No areas of elevated or significantly higher concentration of VOCs were detected in soil gas that would indicate a potential source area of these chemicals at the site.

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The broad, low level distribution of VOCs in site soil gas is a marked contrast to the localized presence and distribution of VOCs in soil reported at the AANG site, south of the site, where a known source to groundwater exists. One of the known sources of chemicals to groundwater at the AANG site is an equipment wash rack area, referred to as Area 5 (See Figure 3). In Area 5, TCE, PCE, and 1,1,1-TCA were detected in soil gas at maximum concentrations of 3036, 83.88, and 55.14 $\mu\text{g/l}$, respectively (see Table 2). TCE was detected in 40 of the 45 soil gas samples collected at concentrations greater than 1 $\mu\text{g/l}$. In addition to the VOCs in soil gas, soil samples from one of the vapor wells in the area (VW-04) were reported to contain carbon tetrachloride (36 $\mu\text{g/kg}$), chloroform (210 $\mu\text{g/kg}$), methylene chloride (50 $\mu\text{g/kg}$), and trans-1,2-DCE (160 $\mu\text{g/kg}$). The localized, very elevated TCE concentrations that indicate the source in Area 5 are illustrated on Figure 4.

The source of the VOCs in soil at Area 5 is known. According to the Remedial Investigation Report (Martin Marietta, 1994¹), the equipment wash rack operated from 1959 until 1985. The waste water generated during the process drained to the sanitary sewer untreated for 21 years (1959 to 1980); then in 1980, an oil/water separator was installed to treat the waste water prior to discharge. Leaks in the drain system, sewer system, and/or the oil/water separator resulted in an on ongoing release of water with chemicals to the subsurface. These past releases are associated with the very high levels of VOCs in the soil gas (e.g., TCE at 3036 $\mu\text{g/l}$).

No such source of chemicals has been identified at the GE site. A below-ground oil/water separator is present at the southern edge of the GE site but soil gas samples collected in the vicinity of the separator did not indicate that the separator has been a source of VOCs to the subsurface. The maximum concentrations of TCE detected in soil gas near the separator was 6 $\mu\text{g/l}$, which is three orders of magnitude lower than the concentrations detected in the wash rack area of the AANG (3036 $\mu\text{g/l}$).

The broad distribution and low concentrations of the VOCs detected in soil gas at the site is consistent with VOCs that have migrated within the vapor phase of the vadose zone from underlying groundwater or a source area some distance away (off-site). The chemicals detected in soil gas at the GE site are the same chemicals detected in soil at AANG and are not chemicals known to have been used at the GE site.

¹ Martin Marietta Energy Systems, Inc., 1994, Draft Final Installation Restoration Program Remedial Investigation Report, 162nd Fighter Wing Arizona Air National Guard, Tucson International Airport Superfund Site, Tucson, Arizona, October.

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In addition, none of the chemicals that are known to have been used at the GE site were detected in soil gas, indicating that significant spillage of chemicals has not occurred during GE operations.

TCE in Groundwater

Groundwater beneath the AANG site contains elevated levels of VOCs and a groundwater extraction, treatment, and reinjection system has operated at the AANG site since May 1997. Groundwater quality distribution maps and potentiometric surface maps prepared in 1996² are included as Figures 5 through 8 and show northwesterly flow directions with a plume of TCE migrating northwesterly from the AANG site and to the west of the GE site. The highest TCE concentration detected in shallow groundwater at the northwestern boundary of the AANG site was 18 µg/l in 1996.

Based on AANG's estimated groundwater velocity of 276 to 1606 feet per year (see Table 3), a retardation factor for TCE of 2, and the assumption that groundwater was not impacted until 1970³, the plume of VOCs in groundwater would extend between 4000 and 23,300 feet from the AANG site. This distance is consistent with the length of the plume being investigated by EPA (currently estimated to extend 5500 feet from the northern boundary of the AANG site).

AANG has been operating groundwater extraction wells at their site since May 1997 and reinjecting treated water into the subsurface at the northeastern corner of their site (Figure 9). A map of hydraulic capture obtained by the extraction system is provided as Figure 9 and a recent potentiometric surface map for shallow groundwater is provided as Plate 1. The clean water being reinjected upgradient of the GE site would result in dilution of the groundwater plume immediately downgradient of the AANG site and would cause the apparent disconnection between the source area plume and the downgradient plume (see Plates 1 and 2).

Summary of TCE Data in Site Vicinity

Based on the lack of use of TCE at the GE facility, the fact that the on-site soil gas data do not indicate a VOC source at the site, the fact that the groundwater plume is located to the west of the GE facility (not directly downgradient), and all the groundwater data are consistent with

² ERM West, 1996, Installation Restoration Program, Final Semi-Annual Ground Water Monitoring Report for the June 1996 Round, 162nd Fighter Wing Arizona Air National Guard, Tucson International Airport Superfund Site, Tucson, Arizona, October.

³ Initial impact to groundwater in 1970 is a conservative assumption. Wastewater generated at the wash rack area was discharged untreated to the sanitary sewer between 1959 and 1980; leaks in the sanitary sewer would have resulted in an ongoing source to the subsurface.

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the source of chemicals being the AANG site, we conclude that the GE facility has not contributed to the TCE in groundwater in the site vicinity.

PCBS AND TRICHLOROBENZENE IN SOIL

Eighteen soil samples were collected from eight boring locations to assess the presence of heavier-end hydrocarbons (mineral oils), PCBs and VOCs in soil north of (behind) the GE facility, where transformers and other equipment have been stored. The sampling locations are shown on Figure 2. Heavier-end hydrocarbons (C10-C32) were detected in four samples collected from three locations (maximum concentration: 1200 milligrams per kilogram [mg/kg]). PCBs were detected in eight samples collected from five locations (the maximum concentration was 20 mg/kg). Two trichlorobenzenes (TCBs) were detected. 1,2,3- TCB and 1,2,4-TCB were both detected in four samples from two locations (maximum concentration of 1,2,3-TCB was 37 mg/kg and the maximum concentration of 1,2,4-TCB was 110 mg/kg) (Dames & Moore, 1998). No other VOCs were detected in the soil samples collected.

The soil analytical results at the site are provided in Table 4. At the locations where chemicals were detected, the highest concentrations were consistently detected in the shallowest samples collected with one exception. At soil boring SB-6, the deeper sample had higher concentrations of PCBs (5 foot sample=0.098 mg/kg, 25 foot sample=0.84 and 0.55 mg/kg; Table 4)

Potential Impacts from PCB and TCB, and Proposed Remedy

Based on the current data, heavy hydrocarbons, PCBs and TCB occur in shallow soil in the unpaved area at the back of the facility. This distribution is consistent with the probable source of these chemicals being past storage and handling of transformers. The only potential impacts from these chemicals are exposure to site workers and migration of surface soil off-site in storm water (this could occur during storm events of sufficient duration that shallow soil is saturated and rain water flows off site rather than infiltrates).

Based on the limited extent of PCB and TCB in shallow soil, the very low solubility of these chemicals, and the more than 80 feet to groundwater, we would not expect any impact to groundwater. To limit human contact with soil and eliminate the potential for soil containing PCBs and/or TCB to migrate off-site in storm water, GE is proposing to cover the unpaved portion of the site directly behind the building (39000 square feet) with a 6-inch-thick layer of crushed rock and gravel. The area to be covered is shown on Figure 10. GE uses the northern portion of the property for storage and has no plans to develop it. There will be no reason for anyone to dig beneath the gravel in the future and contact soil.

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If you have any questions or need additional information, please contact Mr. Bryce MacDonald of GE at (518) 385-4980 or me at (510) 663-4264.

Sincerely yours,
GEOMATRIX CONSULTANTS, INC.



Lisa D. Rowles, R.G.
Project Director

LDR\nji

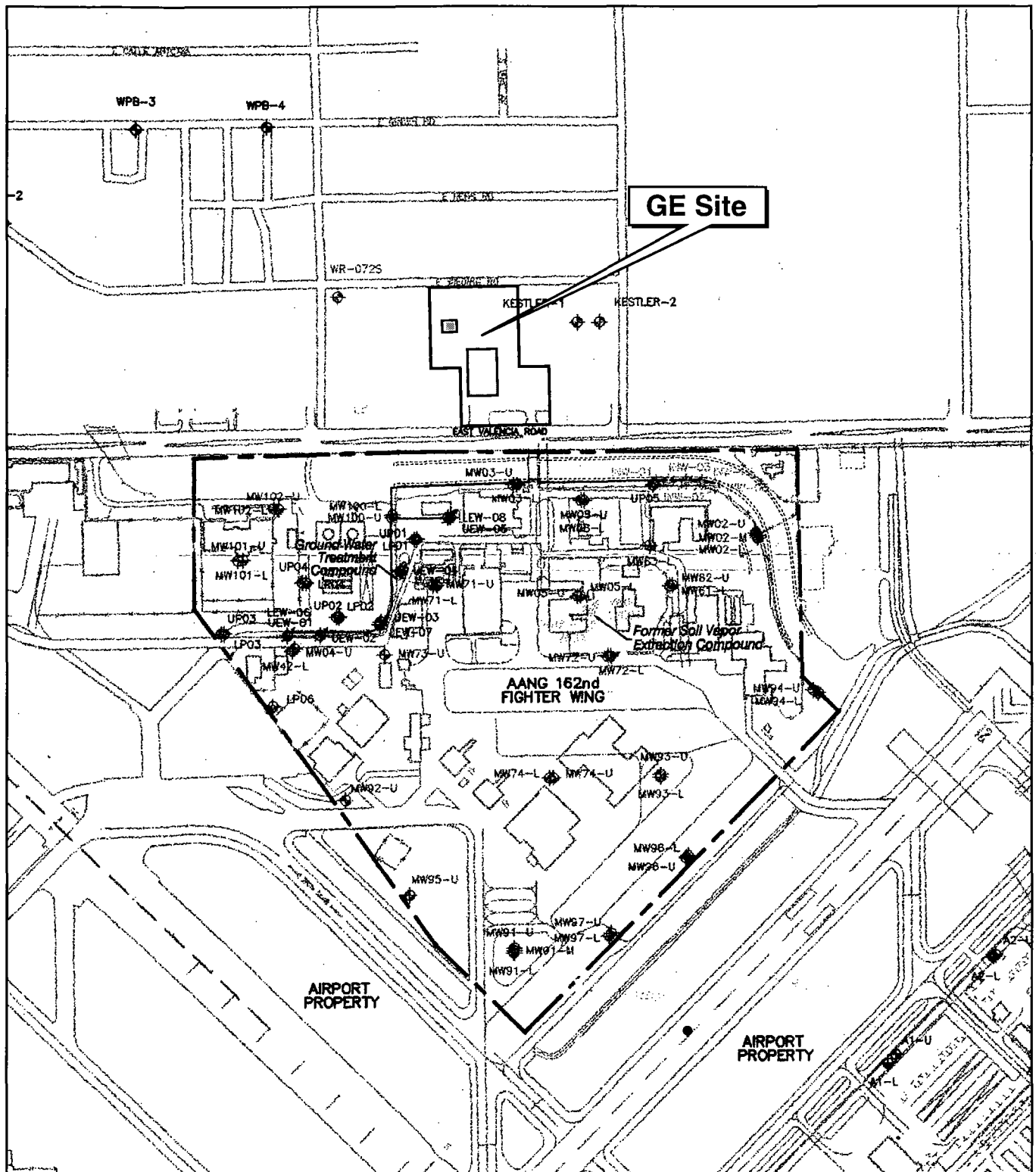
Enclosures: Figure 1: Site Location Map
Figure 2: Site Plan
Figure 3: AANG Site 5 Location Map
Figure 4: TCE Concentration in Soil Gas at Area 5
Figure 5: Potentiometric Surface Map of the Upper Subunit (June 1996)
Figure 6: Potentiometric Surface Map of the Lower Subunit (June 1996)
Figure 7: TCE Plume in the Upper Subunit (June 1996)
Figure 8: TCE Plume in the Lower Subunit (June 1996)
Figure 9: Hydraulic Capture Zone of TCE Plume at AANG (June 1997)
Figure 10: Area to be Covered by Gravel

Table 1: Soil Gas Results – GE
Table 2: Soil Gas Results – AANG Area 5
Table 3: AANG Groundwater Velocity Estimates
Table 4: Soil Sample Analytical Results – GE

Plate 1: Potentiometric Surface of the Upper Subunit (November 1998)
Plate 2: TCE Plume in the Upper Subunit (November 1998)

cc: B. MacDonald, GE

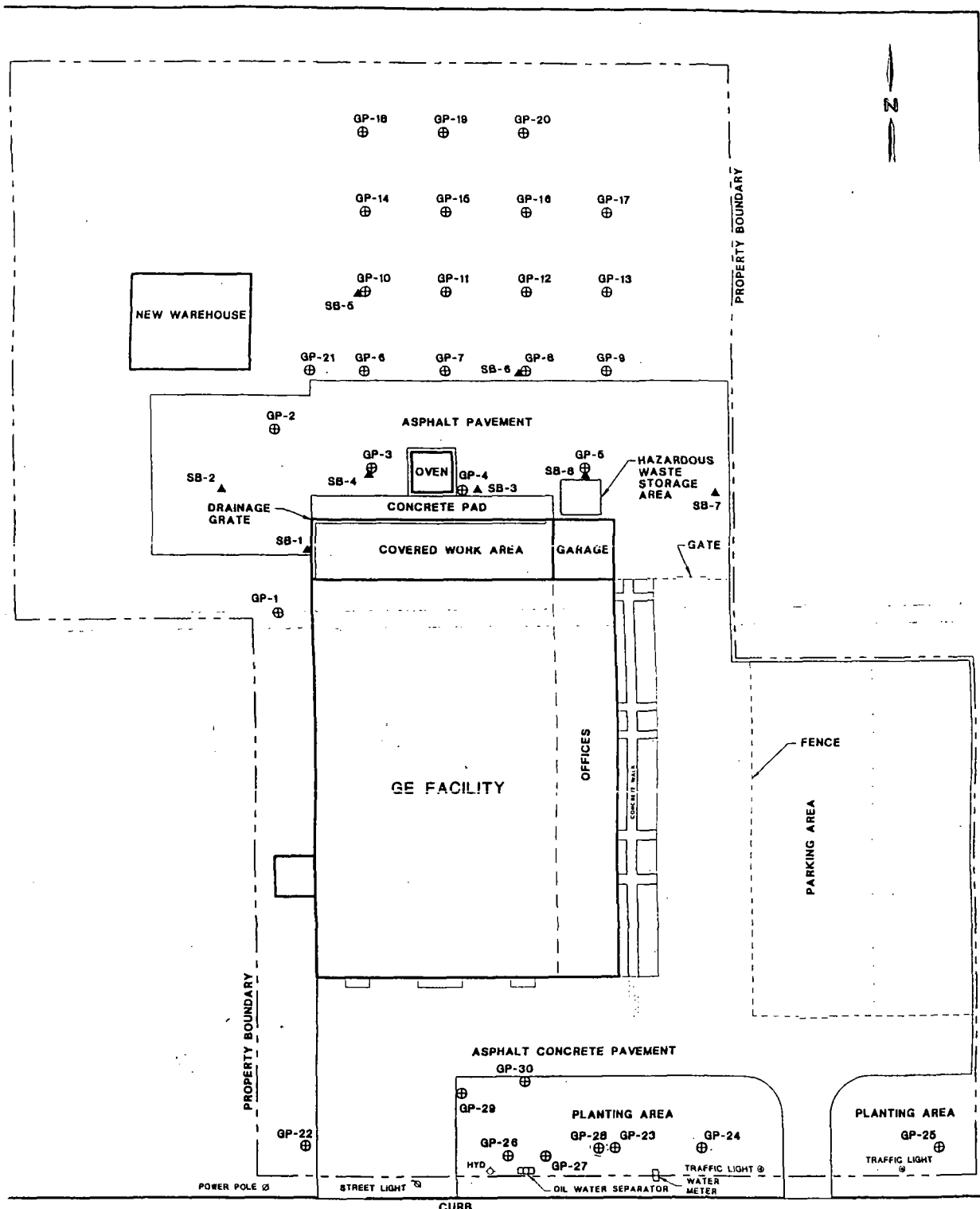
FIGURES



SITE LOCATION MAP
 General Electric
 1401 East Valencia Street
 Tucson, Arizona

Project No.
 5327

Figure
 1



EXPLANATION:

- SB-1 ▲ SOIL BORING LOCATION
- GP-21 ⊕ SOIL GAS PROBE LOCATION

SCALE
0 50 100
SCALE IN FEET

Geomatrix Figure 2
(from Dames & Moor, 1998)

GE Facility
Tucson, Arizona

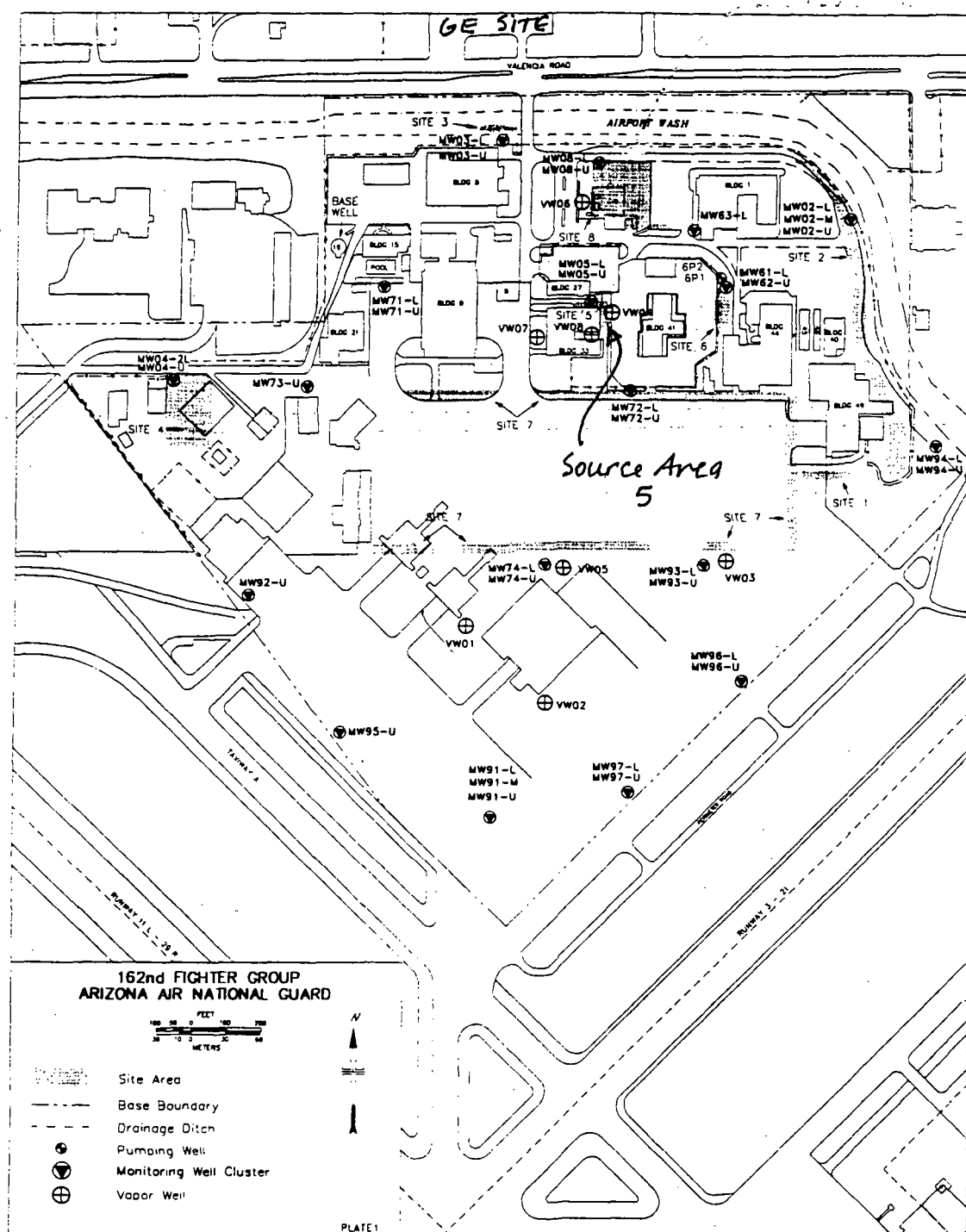


Fig. 1.4. Investigation sites at the Arizona ANGB.

Geomatrix Figure 3
(from Martin Marietta, 1994)

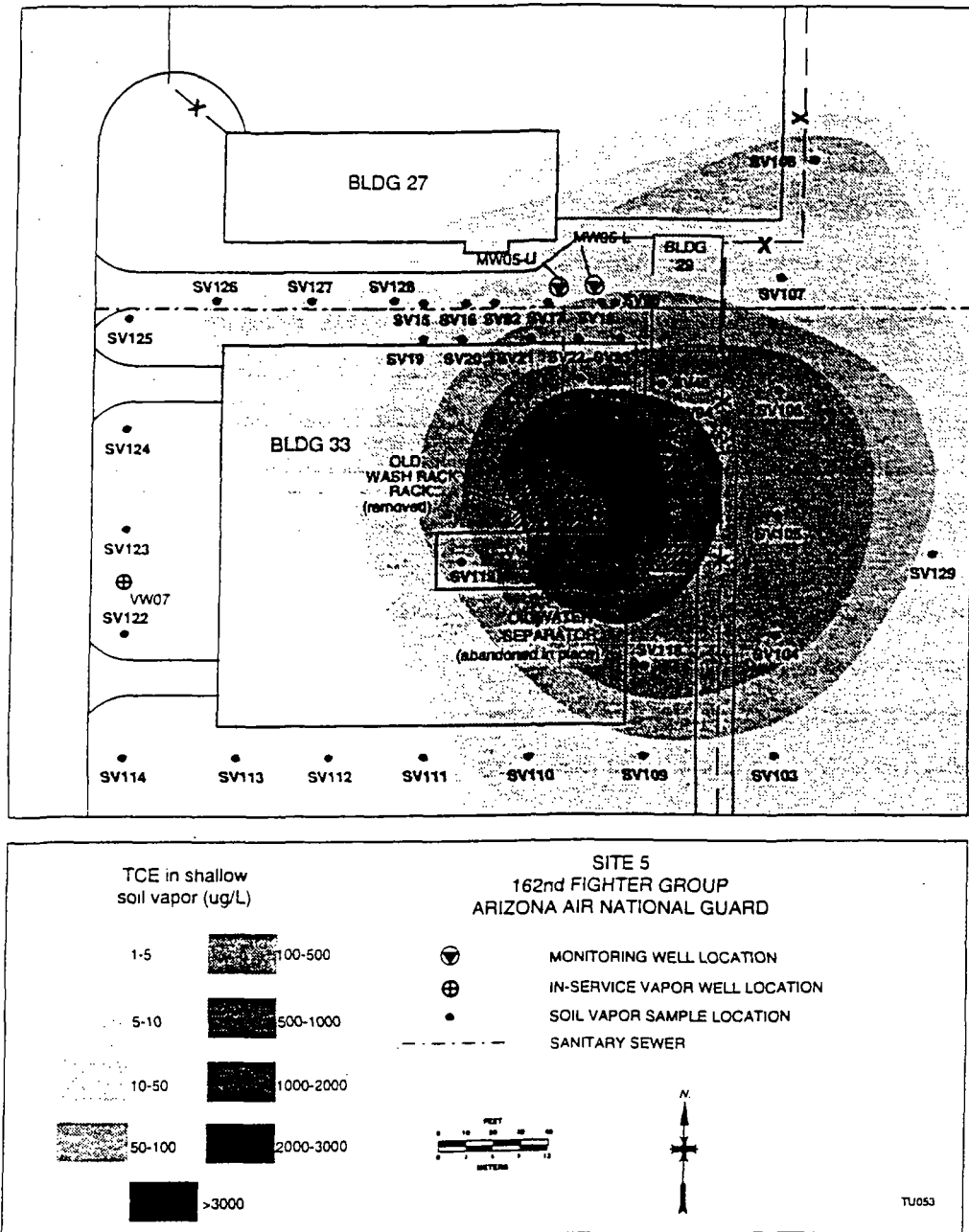
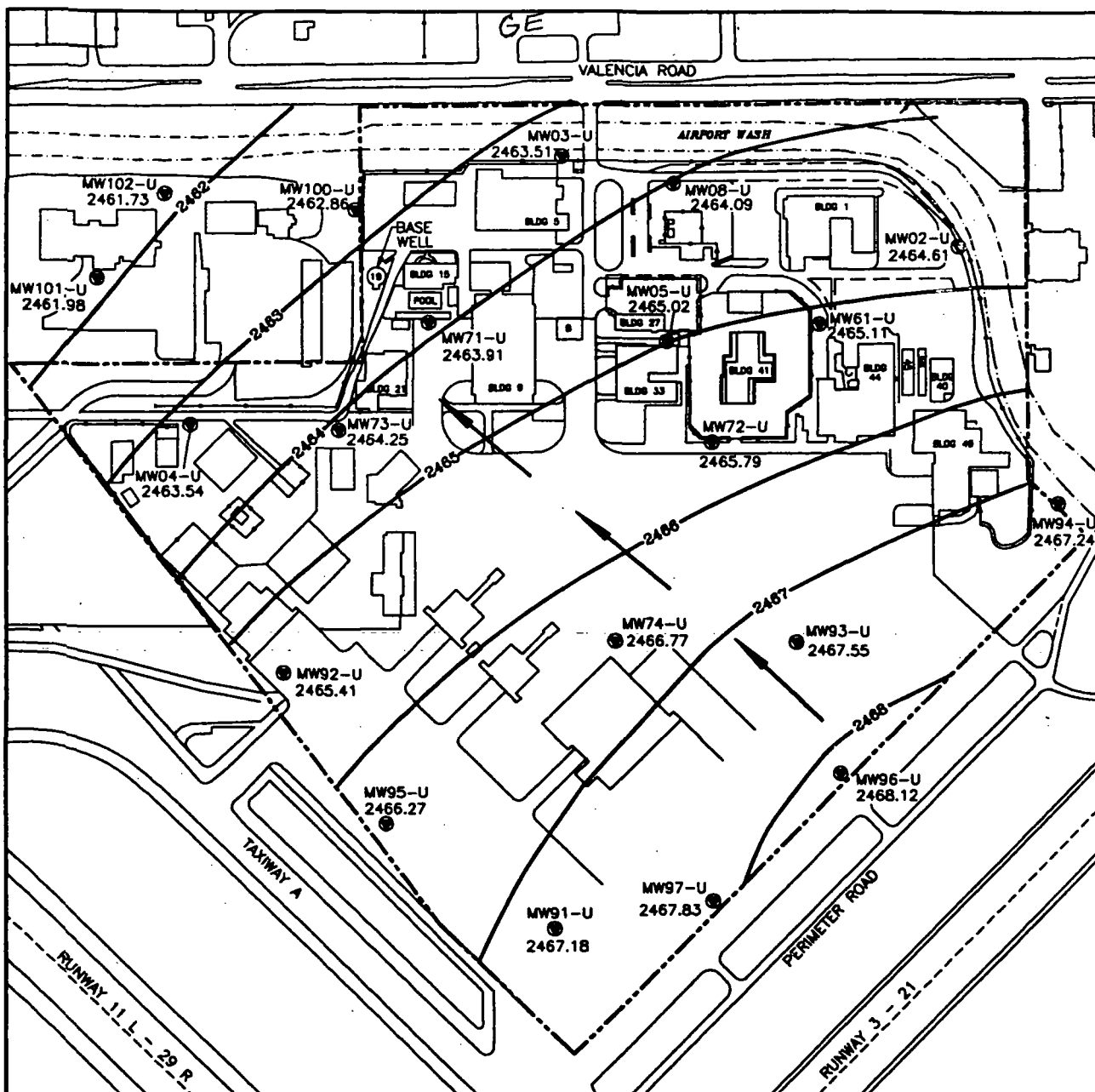


Fig 7.2. Distribution of TCE in shallow soil vapor at Site 5.



EXPLANATION

- POTENTIOMETRIC SURFACE (JUNE, 1996)
- UPPER COMPLETIONS
 - 2466 — CONTOUR INTERVAL = 1 ft
 - - - - - BASE BOUNDARY
 - - - - - DRAINAGE DITCH
 - MONITORING WELL LOCATION
 - GROUNDWATER FLOW DIRECTION
 - 2463.54 GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL

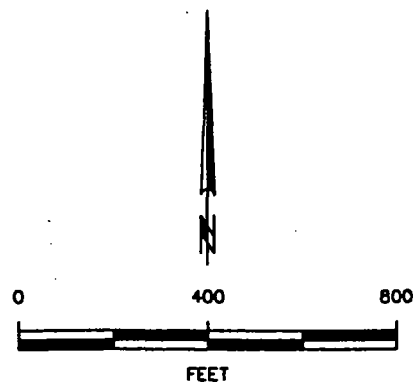


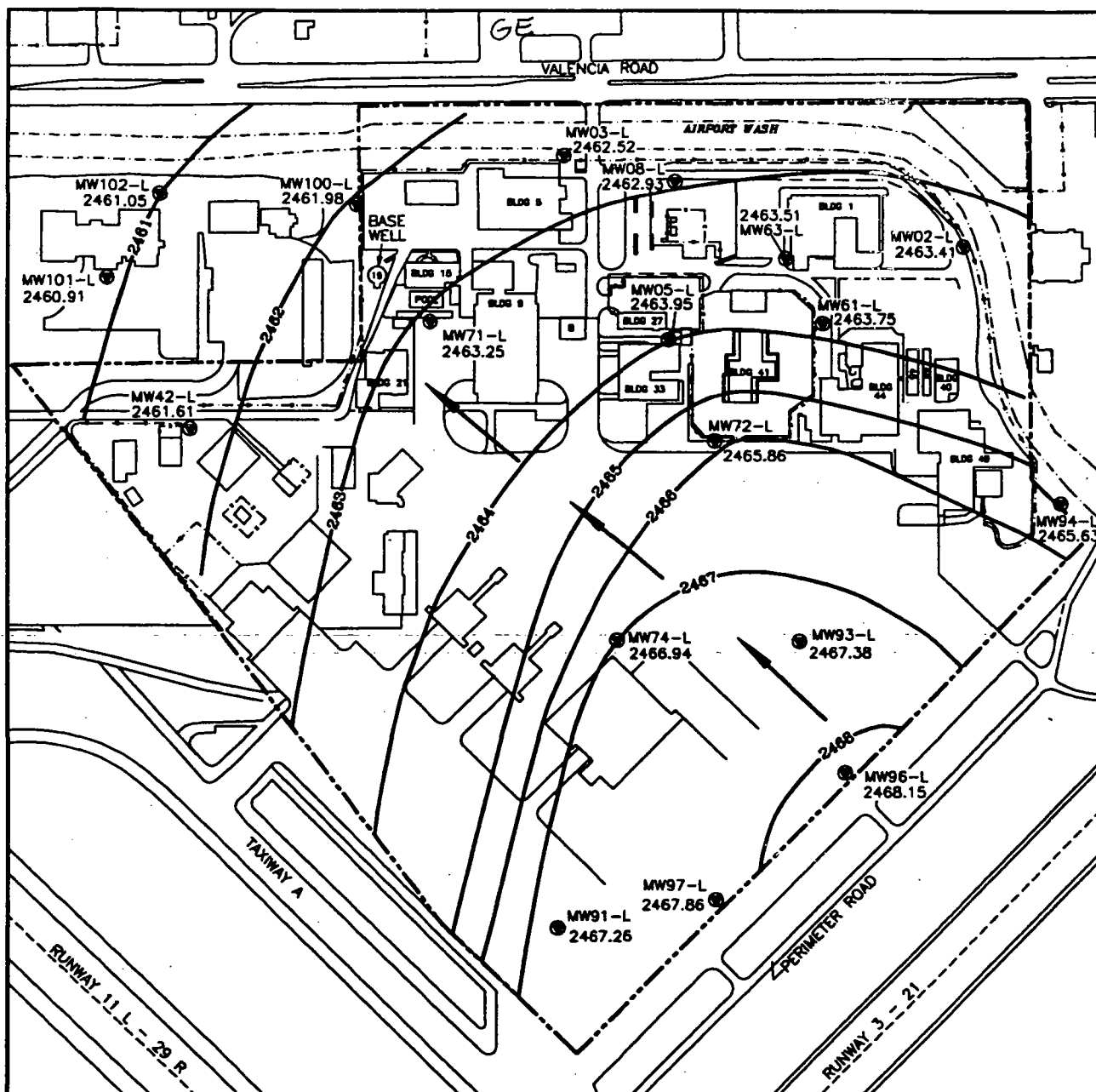
FIGURE 3-1

POTENTIOMETRIC SURFACE OF THE
UPPER SUBUNIT OF THE UPPER
REGIONAL AQUIFER (JUNE 1996)

C:\ERM\TUANG\9660\9660F3-1

Geomatrix Figure 5
(from ERM, 1996)

11 JULY 1996



EXPLANATION

- POTENTIOMETRIC SURFACE (JUNE, 1996)
- 2465 — LOWER COMPLECTIONS
 - CONTOUR INTERVAL = 1 ft
 - - - - - BASE BOUNDARY
 - - - - - DRAINAGE DITCH
 - MONITORING WELL LOCATION
 - GROUNDWATER FLOW DIRECTION
 - 2460.91 GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL

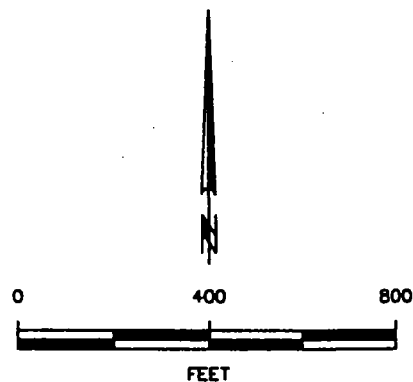
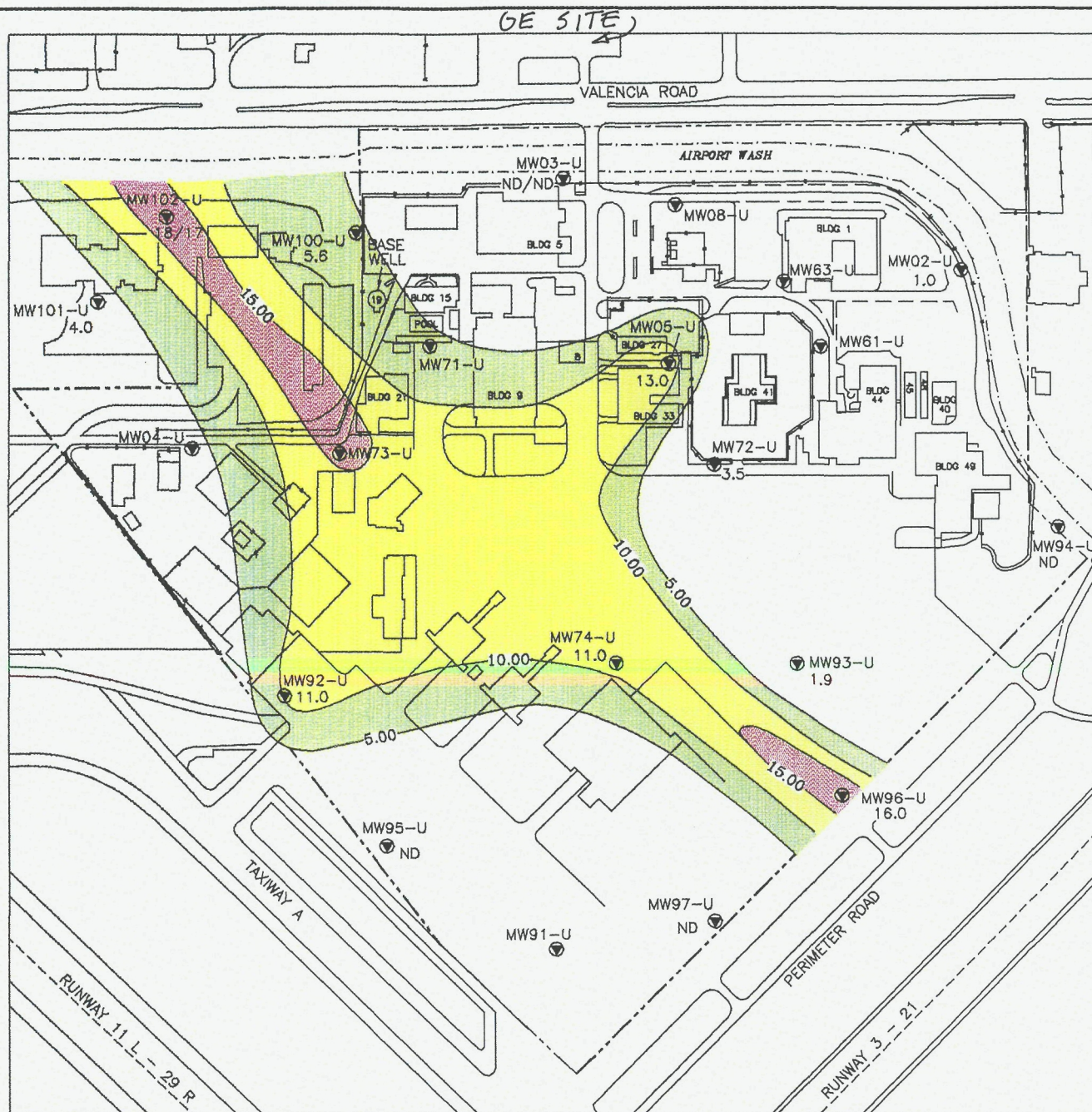


FIGURE 3-2

POTENTIOMETRIC SURFACE OF THE
LOWER SUBUNIT OF THE UPPER
REGIONAL AQUIFER (JUNE 1996)

Geomatrix Figure 6
(From ERM, 1996)



EXPLANATION

- 10.00 — ISOCONCENTRATION CONTOUR INTERVAL = 5 MICROGRAMS PER LITER
- BASE BOUNDARY
- - - DRAINAGE DITCH
- MONITORING WELL LOCATION
- 1.9 TCE CONCENTRATION IN MICROGRAMS PER LITER
- ND NONE DETECTED
- TCE CONCENTRATIONS BETWEEN 5-10 MICROGRAMS PER LITER
- TCE CONCENTRATIONS BETWEEN 10-15 MICROGRAMS PER LITER
- TCE CONCENTRATIONS GREATER THAN 15 MICROGRAMS PER LITER

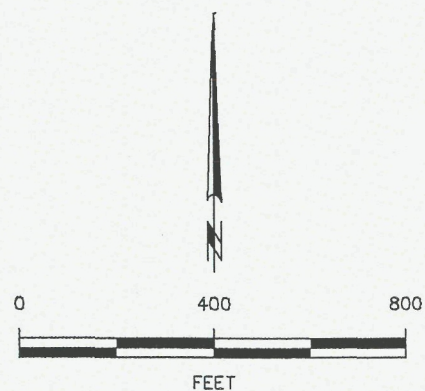
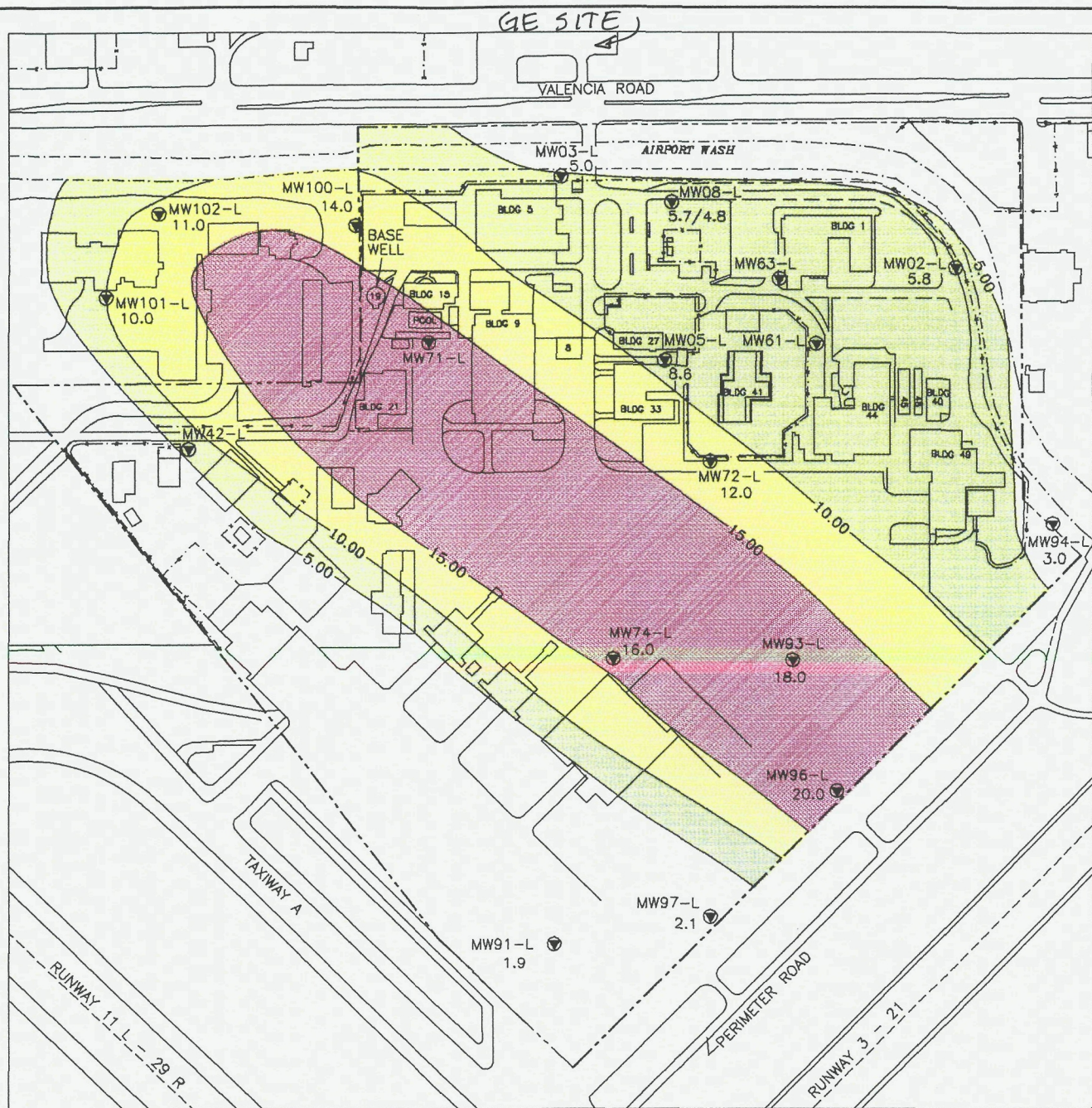


FIGURE 3-3

TCE PLUME IN THE
UPPER SUBUNIT OF THE UPPER
REGIONAL AQUIFER (JUNE 1996)

Geomatrix Figure 7
(from ERM, 1996)



EXPLANATION

- 10.00— ISOCONCENTRATION CONTOUR INTERVAL = 5 MICROGRAMS PER LITER
- BASE BOUNDARY
- - - DRAINAGE DITCH
- ▼ MONITORING WELL LOCATION
- 12 TCE CONCENTRATION IN MICROGRAMS PER LITER
- ND NONE DETECTED
- Light Green TCE CONCENTRATIONS BETWEEN 5-10 MICROGRAMS PER LITER
- Yellow TCE CONCENTRATIONS BETWEEN 10-15 MICROGRAMS PER LITER
- Pink TCE CONCENTRATIONS GREATER THAN 15 MICROGRAMS PER LITER

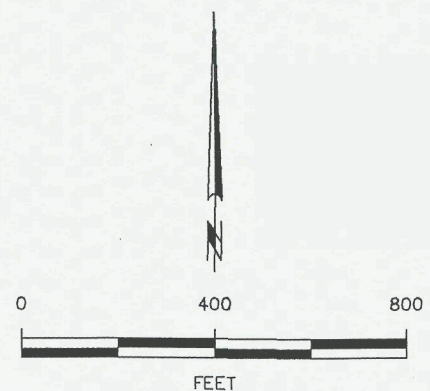


Figure 7
FIGURE 3-4

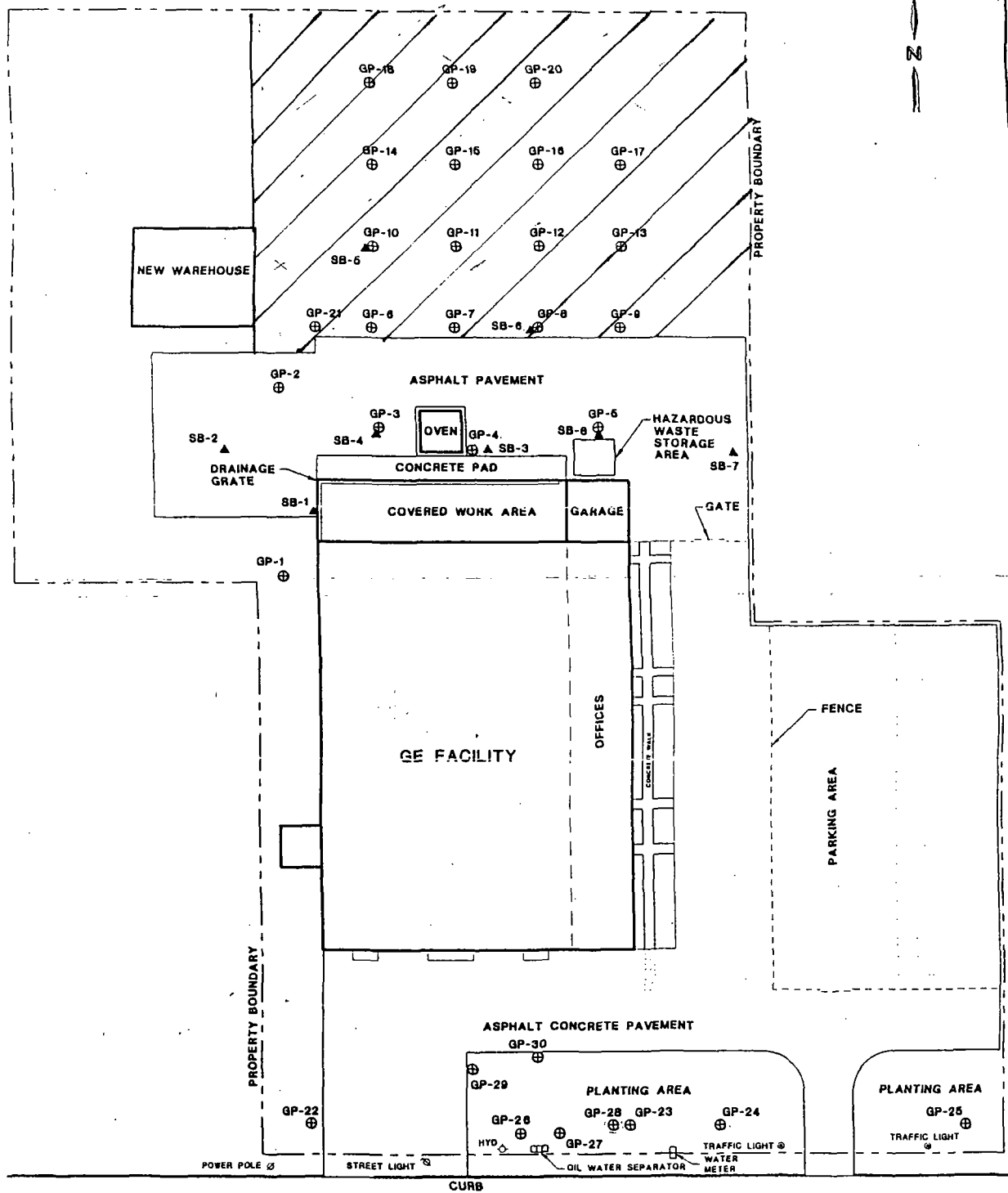
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TCE PLUME IN THE LOWER SUBUNIT OF THE UPPER REGIONAL AQUIFER (JUNE 1996)

3-11

1
Geomatrix Figure 8
(from ERM, 1996)

11 JULY 1996



EXPLANATION:

- SB-1 ▲ SOIL BORING LOCATION
GP-21 ⊕ SOIL GAS PROBE LOCATION

/// AREA TO BE COVERED WITH GRAVEL

SCALE
0 50 100
SCALE IN FEET

Geomatrix Figure 10

GE Facility
Tucson, Arizona

TABLES

TABLE 1
SOIL GAS ANALYTICAL RESULTS

Sample ID	Depth (ft)	Methylene Chloride	Chloroform	1,2-DCA	1,1,1-TCA	Carbon Tetrachloride	TCE	PCE	Total Volatile Hydrocarbons
Soil Gas Screening Level (1)		0.52	0.8	0.02	124	0.32	1.31	0.43	na
<i>Soil Gas Samples Collected August 7 and 11, 1998</i>									
GP-1	10	0.02	0.002	<0.02	0.002	<0.0002	<0.001	0.09	<0.2
GP-2	10	0.01	0.002	<0.02	<0.0005	<0.0002	<0.001	0.06	<0.2
GP-3	15	0.1	0.004	<0.02	0.03	<0.0002	<0.001	0.03	1
GP-3	25	0.1	0.005	<0.02	0.006	<0.0002	<0.001	0.02	18
GP-4	15	0.02	0.0006	<0.02	0.003	<0.0002	<0.001	0.02	<0.2
GP-4	25	0.05	0.004	<0.02	0.009	<0.0002	0.009	0.04	24
GP-5	15	0.1	<0.002	<0.06	<0.001	<0.0006	<0.002	0.02	<0.5
GP-5	20	0.007	<0.0008	<0.02	<0.0005	<0.0002	<0.001	0.02	<0.2
GP-6	15	0.03	0.004	<0.02	0.007	0.0009	0.05	0.06	<0.2
GP-6	25	0.03	0.009	<0.02	0.007	0.001	0.1	0.08	<0.2
GP-7	15	0.02	0.002	<0.02	0.005	<0.0002	<0.001	0.01	<0.2
GP-7	21	0.02	0.002	<0.02	<0.0005	<0.0002	0.001	0.02	<0.2
GP-8	15	0.05	0.006	<0.02	<0.0005	0.0005	0.02	0.07	0.5
GP-8	21	0.2	0.008	<0.02	<0.0005	<0.0002	<0.001	0.01	2
GP-9	15	0.01	0.001	0.03	<0.0005	0.0003	0.006	0.01	<0.2
GP-9	20	0.02	0.003	0.02	<0.0005	<0.0003	0.02	0.03	<0.2
GP-10	15	0.03	0.004	<0.02	0.002	0.001	0.04	0.03	<0.2
GP-10	25	0.3	0.01	<0.02	0.003	0.001	0.003	0.02	6
GP-11	15	0.07	0.002	<0.02	0.001	0.0003	0.005	0.02	<0.2
GP-11	21	0.08	0.007	<0.02	0.06	<0.0002	0.008	0.06	<0.2
GP-12	15	0.03	0.002	<0.03	0.002	<0.0003	<0.001	0.006	<0.2
GP-12	23	0.05	0.006	<0.03	<0.0005	0.0004	0.03	0.03	<0.2
GP-13	15	<0.002	<0.0009	<0.03	<0.0005	<0.0003	<0.001	<0.001	<0.2
GP-13	22	0.07	0.005	<0.03	<0.0005	<0.0003	0.006	0.01	<0.2
GP-14	15	0.009	0.0009	<0.03	<0.0005	0.0003	0.03	0.02	<0.2
GP-14	23	<0.002	<0.0009	<0.03	<0.0005	<0.0003	<0.001	<0.001	<0.2
GP-15	15	0.02	0.002	<0.03	<0.0005	0.0006	<0.001	0.007	<0.2
GP-15	25	0.1	0.004	<0.03	<0.0005	0.0008	0.04	0.03	<0.2
GP-16	15	0.02	0.003	<0.03	<0.0005	0.0002	0.007	0.03	<0.2
GP-16	25	0.02	0.005	<0.03	<0.0005	0.0004	0.03	0.07	<0.2
GP-17	15	0.07	0.002	<0.02	<0.0005	<0.0003	<0.001	0.007	<0.2
GP-17	20	0.02	0.002	<0.02	<0.0005	<0.0003	0.004	0.01	<0.2
GP-18	15	0.004	<0.0009	<0.03	<0.0005	<0.0003	<0.001	0.003	<0.2
GP-18	25	0.07	0.003	<0.03	<0.0005	<0.0003	<0.001	0.002	<0.2
GP-19	15	0.05	0.0007	<0.03	0.002	0.0004	<0.001	0.003	<0.2
GP-19	25	0.04	0.004	0.04	<0.0005	0.0007	0.03	0.02	<0.2
GP-20	15	<0.002	<0.0009	<0.03	<0.0005	0.0003	<0.001	<0.001	<0.2
GP-20	25	0.02	0.003	<0.03	<0.0005	0.0004	0.01	0.02	<0.2
GP-21	15	<0.002	<0.0009	<0.03	<0.0005	<0.0003	<0.001	0.008	<0.2
GP-21	25	0.03	0.007	<0.03	0.0005	0.0008	0.08	0.09	<0.2
<i>Soil Gas Samples Collected August 19, 1998</i>									
GP-22	10	<0.02	<0.001	<0.02	<0.001	<0.0004	0.2	0.2	<0.2
GP-22	20	<0.02	<0.001	<0.02	<0.001	<0.0004	0.6	0.2	<0.2
GP-22	22	0.04	<0.001	<0.02	<0.001	<0.0004	0.6	0.1	<0.2
GP-23	10	<0.02	<0.001	<0.02	0.03	<0.0004	0.2	0.2	<0.2



TABLE 1 (Continued)

Geomatrix Table 1
(concluded)

Sample ID	Depth (ft)	Methylene Chloride	Chloroform	1,2-DCA	1,1,1-TCA	Carbon Tetrachloride	TCE	PCE	Total Volatile Hydrocarbons
Soil Gas Screening Level (1)		0.52	0.8	0.02	124	0.32	1.31	0.43	na
GP-23	20	0.2	0.006	<0.02	0.04	<0.0004	0.2	0.1	<0.2
GP-23	23	0.3	0.006	<0.02	0.006	<0.0004	0.02	0.05	2
GP-24	10	<0.02	<0.001	<0.02	<0.001	<0.0004	1	0.1	<0.2
GP-24	20	0.06	0.007	<0.02	0.0004	<0.0004	2	0.2	0.8
GP-24	28	0.1	0.08	<0.02	0.004	<0.0004	6	0.6	2
GP-25	10	0.05	<0.001	<0.02	<0.001	<0.0004	0.4	0.05	<0.2
GP-25	14	0.4	<0.001	<0.02	<0.001	<0.0004	0.4	0.05	<0.2
GP-26	15	0.02	<0.001	<0.02	0.04	<0.0004	0.009	0.2	<0.2
GP-27	15	0.02	<0.001	<0.02	0.09	<0.0004	0.08	0.6	<0.2
GP-28	30	0.6	<0.007	<0.09	<0.005	<0.002	2	0.2	2
GP-29	10	<0.02	<0.001	<0.02	0.003	<0.0004	0.2	0.1	<0.2
GP-30	10	<0.02	0.0002	<0.02	0.001	<0.0004	0.4	0.1	<0.2

Notes:

- 1 Soil Gas Screening Levels (SGSL) were developed by the EPA specifically for the evaluation of shallow soil gas data at the TIAA site. Results presented in micrograms per liter µg/l.

Bolded results exceed the SGSL.



7-13

Table 7.2. Results of the shallow-soil-vapor survey at Site 5

Sample Location	Concentrations, $\mu\text{g/L}$ in air		
	1,1,1-TCA	TCE	PCE
SV15			0.30
SV16			0.50
SV17			0.31
SV18			13.00
SV19			0.04
SV20			0.05
SV21			0.09
SV22			22.0
SV49			0.06
SV50			0.07
SV92	0.26	14.01	12.88
SV93	0.32	46.05	17.52
SV94	12.40	701	83.30
SV103	0.29	33.91	8.14
SV104	0.80	152.11	37.12
SV105	2.53	252.06	61.65
SV106	1.69	139.81	37.14
SV107	0.51	12.89	2.65
SV108	0.44	12.23	2.11
SV109	0.32	72.43	19.27
SV110	0.25	18.33	4.21
SV111	0.23	7.14	1.24
SV112	0.18	0.33	
SV113	0.69	3.72	
SV114	0.48	2.79	
SV115	4.18	223.74	64.99
SV116	47.44	3,036 E	83.33 E

7-14
Table 7.2. (continued)

Sample Location	Concentrations, $\mu\text{g/L}$ in air		
	1,1,1-TCA	TCE	PCE
SV117	55.14	1,721 E	83.33 E
SV118	0.99	166.12	42.89
SV119	1.09	68.09	19.13
SV120	27.51	1,488 E	83.33 E
SV121	26.63	1,930 E	83.33 E
SV122	0.11	0.17	0.09
SV123	0.16	0.13	
SV124	0.14	0.11	
SV125	0.19	0.46	0.33
SV126	0.22	5.76	1.57
SV127	0.18	4.24	1.66
SV128	0.14	7.49	5.58
SV129	0.17	33.98	23.76

1,1,1-TCA = 1,1,1-trichloroethane

TCE = trichloroethene

PCE = tetrachloroethene

E = estimated value, beyond calibration range

7-14
Table 7.2. (continued)

Sample Location	Concentrations, $\mu\text{g/L}$ in air		
	1,1,1-TCA	TCE	PCE
SV117	55.14	1,721 E	83.33 E
SV118	0.99	166.12	42.89
SV119	1.09	68.09	19.13
SV120	27.51	1,488 E	83.33 E
SV121	26.63	1,930 E	83.33 E
SV122	0.11	0.17	0.09
SV123	0.16	0.13	
SV124	0.14	0.11	
SV125	0.19	0.46	0.33
SV126	0.22	5.76	1.57
SV127	0.18	4.24	1.66
SV128	0.14	7.49	5.58
SV129	0.17	33.98	23.76

1,1,1-TCA = 1,1,1-trichloroethane

TCE = trichloroethene

PCE = tetrachloroethene

E = estimated value, beyond calibration range

7-19

Table 7.3. Results of vapor well samples at Site 5

Vapor well: depth interval, ft	Results, $\mu\text{g/L}$ in air		
	1,1,1-TCA	TCE	PCE
VW04: 9 to 14	24.64	1,311	83.3 E
VW04: 27 to 32	0.69	245.75	83.3 E
VW04: 45 to 50	2.59	1,041	83.3 E
VW04: 60 to 65	2.64	1,099 E	83.3 E
VW04: 81 to 86	0.95	1066	83.3 E
VW07: 12 to 14	0.16	11.08	1.50
VW07: 29 to 31	0.25	28.18	3.51
VW07: 48 to 50	0.17	26.13	2.69
VW07: 58 to 60	0.58	93.11	10.91
VW07: 83 to 85		46.07	2.90
VW08: 12 to 14	19.12	1,750 E	83.33 E
VW08: 22 to 24	17.22	1,736 E	83.33 E
VW08: 58 to 60	1.33	409.19	54.42
VW08: 74 to 76	0.35	203.97	23.77
VW08: 83 to 85	0.33	217.61	21.53

1,1,1-TCA = 1,1,1-trichloroethane

TCE = trichloroethene

PCE = tetrachloroethene

E = estimated value, beyond calibration range

2-80

Table 2.10. Summary of hydraulic conductivity, transmissivity, and groundwater flow velocity values from pumping tests

Pumping Test Number	Pumping Well	Observation Well	Transmissivity (T), ft ² /d	Hydraulic Conductivity (K), ft/d	Groundwater Velocity (V)	
					ft/d	ft/year
1	6P1	MW61-L	941.9	67.3	1.35	493
1	6P1	MW63-L	1338.4	95.6	1.91	698
2	6P2	MW62-U	1532	113	2.16	789
3	Base well	MW71-L	1598	114	2.28	832
3	Base well	MW03-L	3106	222	4.44	1606
3	Base well	MW42-L	2367	169	3.38	1234
4	MW42-L	MW04-L	567	37.8	0.76	276

TABLE 2
SOIL ANALYTICAL RESULTS

Sample ID	Depth (ft)	Total-PCBs	TPH (C10-C32)	1,2,3-Trichlorobenzene	1,2,4-Trichlorobenzene	m,p-Xylenes
		Method 8082 (1)	Method 8015AZ	Method 8021B	Method 8021B	Method 8021B
		ug/Kg	mg/Kg	ug/Kg	ug/Kg	ug/Kg
		SRL 13000(2)	SRL 18000	no SRL	SRL 4,700,000	SRL 2,800,000
SB-1	5	ND<50	ND<80	ND<50	ND<100	ND<100
SB-1	25	ND<50	ND<80	ND<50	ND<100	110 U,y
SB-2	5	ND<50	150	ND<50	ND<100	ND<100
SB-2	15	ND<50	ND<80	ND<50	ND<100	ND<100
SB-3	5	670	790 J,d	32,000	100,000	ND<100
SB-3	5(3)	NA	1,200	37,000	110,000	ND<100
SB-3	15	ND<50	ND<80	140	400	100 U,y
SB-4	5	12,000	ND<80	1,200	3,200	ND<100
SB-4	15	310	ND<80	ND<50	ND<100	ND<100
SB-5	5	ND<50	ND<80	ND<50	ND<100	100 U,y
SB-5	15	ND<50	ND<80	ND<50	ND<100	110 U,y
SB-6	5	98	ND<80	ND<50	ND<100	110 U,y
SB-6	25	840	ND<80	ND<50	ND<100	100 U,y
SB-6	25 (3)	550	NA	NA	NA	NA
SB-7	5	ND<50	ND<80	ND<50	ND<100	110 U,y
SB-7	15	150	ND<80	ND<50	ND<100	110 U,y
SB-8	5	20,000	170	ND<50	ND<100	100 U,y
SB-8	15	ND<50	ND<80	ND<50	ND<100	ND<100

(1) SW846, Test Methods for Evaluating Solid Wastes, Update III

(2) Soil Remediation Standards Rule, Non-Residential, Arizona Department of Environmental Quality, December 5, 1997

(3) Laboratory Duplicate Sample

ND Not detected, NA Not analyzed

Bolded results above associated SRL.

J,d The analyte was positively identified; the associated result is approximate due to laboratory duplicate imprecision.

U,y Not detected. The sample quantitation limit was raised to the associated result due to trip blank contamination.

PLATES

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